# PATENT CLAIMS

What is claimed is:

1. A method for controlled application of a stator current set point value ($\underline{I}_{Snom}$) and of a torque set point value ($M_{nom}$) for a converter-fed rotating-field machine (4), with a field-forming current component ($I_{Sdnom}$) of the stator current set point value ($\underline{I}_{Snom}$) being calculated as a function of a predetermined rotor flux set point value ($\Psi_{Rnom}$) and of a determined rotor flux actual value ($\Psi_R$), and with a torque-forming current component ($I_{Sqnom}$) of the stator current set point value ($\underline{I}_{Snom}$) being calculated as a function of a predetermined torque set point value ($M_{nom}$), of the determined rotor flux actual value ($\Psi_R$) and of a determined torque-forming current component ($I_{Sq}$) of a measured stator current ($\underline{I}_S$), with a stator angular frequency actual value ($\omega_s$) being determined as a function of a determined rotor slip frequency ($\omega_R$) and of an angular frequency ($\omega$) and with the integral of the stator voltage ($\Psi_{Knom}$) being calculated as a manipulated variable from these calculated values ($I_{Sdnom}$, $I_{Sqnom}$, $\omega_S$, $\Psi_R$) as a function of the parameters comprising the frequency-dependent stray inductance ($L_o$) and the stator resistance ($R_s$), from which integral a flux path curve is derived, which is selected from stored off-line optimized flux path curves.

2. The method as claimed in Claim 1, characterized in that a steady-state normalized stator voltage ($U_{Sstead}$), which is normalized by means of a measured intermediate circuit voltage ($U_D$), is calculated as a function of the calculated current components ($I_{Sdnom}$, $I_{Sqnom}$), of the parameters comprising the frequency-dependent stray inductance ($L_o$) and the stator resistance ($R_S$), the stator angular frequency ($\omega_S$) and the rotor flux actual value ($\Psi_R$).

3. The method as claimed in one of the abovementioned claims, characterized in that, in order to determine a terminal flux actual value ($\underline{\Psi}_K$) before the integration of the stator voltage ($\underline{U}_S$), a voltage drop caused by the instantaneous stator current ($\underline{I}_S$) across the stator resistance ($R_S$) is subtracted from this and, after the integration, a voltage drop caused by the stator current set point value ($\underline{I}_{Snom}$) to be applied across the stator resistance ($R_S$), divided by the stator angular frequency $\omega_S$, is added after transformation to a coordinate system which is synchronized to the rotor flux.

4. The method as claimed in Claim 2, characterized in that a drive level (a) and a voltage angle ($\delta_U$) are calculated as polar components from the normalized steady-state stator voltage ($\underline{u}_{Sstat}$).

5. The method as claimed in Claims 2 and 4, characterized in that a fundamental terminal flux magnitude is calculated as a function of the measured intermediate-circuit voltage ($U_D$) of the calculated stator angular frequency ($\omega_S$) from the drive level (a) using the following equation:

$$|\underline{\Psi}_K| = \frac{a \cdot U_D \cdot \frac{2}{\pi}}{\omega_S}$$

6. The method as claimed in Claims 2 and 4, characterized in that a continuous terminal flux nominal angle ($\gamma_{\Psi Knom}$) is calculated as a function of a determined continuous rotor flux angle ($\gamma_{\Psi R}$) and of a determined angle ($\delta_{\Psi K}$) between the terminal flux ($\Psi_K$) and the rotor flux ($\Psi_R$) using the following equation:

$$\gamma_{\Psi Knom} = \gamma_{\Psi R} + \delta_{\Psi K}$$

7. The method as claimed in Claim 4, characterized in that the polar component comprising the voltage angle ($\delta_U$) of the normalized steady-state stator voltage component ($\underline{u}_{Sdstead}$) is calculated using the following equation:

$$\delta_U = \arcsin \frac{U_{Sdstead}}{a \cdot U_D \cdot 2/\pi} + 90°$$

8. The method as claimed in Claim 7, characterized in that the angle ($\delta_{\Psi K}$) between the terminal flux ($\Psi_K$) and the rotor flux ($\Psi_R$) is calculated using the following equation:

$$\delta_{\Psi K} = \delta_u - 90° = \arcsin \frac{U_{sdstead}}{a \cdot U_D \cdot 2/\pi}$$